This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method of automatically detecting an occlusion in a fluid line of a syringe pump, the syringe pump including a housing adapted to support a syringe containing a plunger moveable inside the syringe by pushing an end of a plunger with a pusher to expel fluid from an outlet of the syringe into a fluid line connected to the outlet and configured to carry the fluid under pressure to a patient, the method comprising:

mounting the syringe onto the housing with the plunger end extended;

coupling the pusher to the end of the plunger;

initiating a pumping sequence to cause the fluid to flow into the fluid line;

during the pumping sequence, using a sensor to determine a first instantaneous force value indicative of force in the fluid line at time T1;

during the pumping sequence, determining a second instantaneous force value indicative of force in the fluid line at time T2; and

providing an indication of the occlusion if a relationship between the first and second instantaneous force values departs from an expected slope relationship.

2. (Currently Amended) The method of automatically detecting an occlusion of claim 1, further comprising providing no occlusion indication where the relationship does not depart from the expected slope relationship.

3. (Original) The method of automatically detecting an occlusion of claim 1, further comprising determining a steady state condition.

4. (Original) The method of automatically detecting an occlusion of claim 1, wherein determining at least one of the first and second force values further includes using a sensor.

5. (Currently Amended) The method of automatically detecting an occlusion of claim 1, further comprising determining a time window defining at least one of time T1 and time T2.

6. (Currently Amended) The method of automatically detecting an occlusion of claim 1, wherein providing the indication of the occlusion further includes determining at least one of the expected slope relationship and the relationship between the first and second instantaneous force values.

7. (Currently Amended) The method of automatically detecting an occlusion of claim 1, wherein providing the indication of the occlusion further includes determining a trial slope using at least one of the first and second instantaneous force values.

8. (Original) The method of automatically detecting an occlusion of claim 1, wherein providing the indication of the occlusion further includes determining an occlusion slope.

9. (Currently Amended) The method of automatically detecting an occlusion of claim 1, wherein providing the indication of the occlusion further includes comparing the expected slope relationship to the relationship between the first and second instantaneous force values.

10. (Original) The method of automatically detecting an occlusion of claim 1, wherein providing the indication of the occlusion further includes comparing an occlusion slope to a trial slope.

11. (Currently Amended) The method of automatically detecting an occlusion of claim 1, further comprising shifting a time window to obtain an additional instantaneous force value.

12. (Original) The method of automatically detecting an occlusion of claim 1, further comprising canceling the indication of the occlusion in response to a comparison between a trial slope and a cancellation slope.

13. (Currently Amended) A method of automatically detecting an occlusion in a fluid line of a medical pumping system, the fluid line being configured to carry fluid under pressure between a fluid source and a patient, the method comprising:

during a pumping sequence, determining a first instantaneous force value indicative of force in the fluid line at time T1;

during the pumping sequence, determining a second instantaneous force value indicative of force in the fluid line at time T2; and

providing an indication of the occlusion if a relationship between the first and second instantaneous force values departs from an expected slope relationship.

14. (Currently Amended) The method of automatically detecting an occlusion of claim 13, further comprising providing no occlusion indication where the relationship does not depart from the expected slope relationship.

15. (Original) The method of automatically detecting an occlusion of claim 13, further comprising determining a steady state condition.

16. (Original) The method of automatically detecting an occlusion of claim 15, wherein determining the steady state condition further includes determining a steady state startup time period.

17. (Original) The method of automatically detecting an occlusion of claim 16, wherein determining the steady state condition further includes determining a startup time limit.

18. (Original) The method of automatically detecting an occlusion of claim 16, wherein determining the steady state condition further includes determining a startup fluid volume.

19. (Currently Amended) The method of automatically detecting an occlusion of claim 13, wherein determining at least one of the first and second instantaneous force values further includes using a sensor.

20. (Currently Amended) The method of automatically detecting an occlusion of claim 13, wherein determining at least one of the first and second instantaneous force values further includes determining a count indicative of the at least one of the first and second instantaneous force values.

21. (Original) The method of automatically detecting an occlusion of claim 20, further comprising adjusting at least one of time T1 and time T2 to avoid fractioning the count.

22. (Original) The method of automatically detecting an occlusion of claim 20, further comprising using a transducer to generate the count.

23. (Currently Amended) The method of automatically detecting an occlusion of claim 13, further comprising determining a time window defining at least one of time T1 and time T2.

24. (Original) The method of automatically detecting an occlusion of claim 13, wherein providing the indication of the occlusion further includes generating an alarm.

25. (Currently Amended) The method of automatically detecting an occlusion of claim 13, wherein providing the indication of the occlusion further includes determining

at least one of the expected slope relationship and the relationship between the first and second instantaneous force values.

26. (Currently Amended) The method of automatically detecting an occlusion of claim 13, wherein providing the indication of the occlusion further includes determining a trial slope using at least one of the first and second instantaneous force values.

27. (Original) The method of automatically detecting an occlusion of claim 13, wherein providing the indication of the occlusion further includes determining an occlusion slope.

28. (Currently Amended) The method of automatically detecting an occlusion of claim 13, wherein providing the indication of the occlusion further includes comparing the expected slope relationship to the relationship between the first and second instantaneous force values.

29. (Original) The method of automatically detecting an occlusion of claim 13, wherein providing the indication of the occlusion further includes comparing an occlusion slope to a trial slope.

30. (Currently Amended) The method of automatically detecting an occlusion of claim 13, further comprising shifting a time window to obtain an additional instantaneous force value.

31. (Original) The method of automatically detecting an occlusion of claim 13, further comprising canceling the indication of the occlusion in response to a comparison between a trial slope and a cancellation slope.

32. (Currently Amended) The method of automatically detecting an occlusion of claim 13, wherein determining the first instantaneous force value further includes altering delivery of the fluid.

33. (Currently Amended) The method of automatically detecting an occlusion of claim 13, wherein determining the first instantaneous force value further includes altering delivery of the fluid in response to comparing the first instantaneous force value to a bolus occlusion limit.

34. (Currently Amended) The method of automatically detecting an occlusion of claim 33, wherein determining the first instantaneous force value further includes resuming delivery of the fluid after a delay time.

35. (Currently Amended) The method of automatically detecting an occlusion of claim 33, wherein determining the first instantaneous force value further includes resuming delivery of the fluid in response to comparing the first instantaneous force value to a bolus occlusion limit.

36. (Original) The method of automatically detecting an occlusion of claim 13, wherein providing the indication of the occlusion further includes initiating a remedial action.

37. (Currently Amended) A method of automatically detecting an occlusion in a fluid line of a syringe pump, the syringe pump including a housing adapted to support a syringe containing a plunger moveable inside the syringe by pushing an end of a plunger with a pusher to expel fluid from an outlet of the syringe into a fluid line connected to the outlet and configured to carry the fluid under pressure to a patient, the method comprising:

mounting the syringe onto the housing with the plunger end extended;

coupling the pusher to the end of the plunger;

initiating a pumping sequence to cause the fluid to flow into the fluid line;

during the pumping sequence, determining a first instantaneous force value indicative of force in the fluid line at time T1;

altering delivery of the fluid if the first instantaneous force value deviates from an expected value; and

automatically resuming the delivery of the fluid after a delay period.

38. (Original) The method of automatically detecting an occlusion of claim 37, wherein altering the delivery of the fluid further includes determining the delay period.

39. (Original) The method of automatically detecting an occlusion of claim 37, wherein resuming the delivery of the fluid further includes resuming the delivery at a reduced infusion rate.

40. (Currently Amended) A method of automatically detecting an occlusion in a fluid line of a medical pumping system, the fluid line being configured to carry fluid under pressure between a fluid source and a patient, the method comprising:

during a pumping sequence, determining a first instantaneous force value indicative of force in the fluid line at time T1;

altering delivery of the fluid if the first instantaneous force value deviates from an expected value; and

automatically resuming the delivery of the fluid after a delay period.

41. (Currently Amended) The method of automatically detecting an occlusion of claim 40, further comprising providing an indication of an occlusion if a second instantaneous force value indicative of force in the fluid line at time T2 deviates from the expected value.

42. (Original) The method of automatically detecting an occlusion of claim 40, wherein altering the delivery of the fluid further includes determining the expected value.

43. (Original) The method of automatically detecting an occlusion of claim 40, wherein resuming the delivery of the fluid further includes determining the delay period.

44. (Original) The method of automatically detecting an occlusion of claim 40, wherein resuming the delivery of the fluid further includes resuming the delivery at a reduced infusion rate.

45. (Original) The method of automatically detecting an occlusion of claim 40, further comprising determining if a bolus infusion is indicated.

46. (Currently Amended) A syringe pumping system, comprising:

a syringe configured to contain fluid and including an outlet;

a housing adapted to support the syringe;

a plunger having an end and configured to move within the syringe;

a pusher adapted to attach to and push the end of the plunger so as to cause the fluid to exit out of the outlet of syringe;

a fluid line connected to the outlet of the syringe and configured to carry the fluid under force to a patient;

a sensor for determining at least one of first and second instantaneous force values indicative of the force between the syringe and the patient taken at times T1 and T2, respectively; and

a processor in communication with the pusher, the processor being configured to execute program code that determines if a relationship between the first and second instantaneous force values departs from an expected slope relationship.

47. (Currently Amended) The syringe pumping system of claim 46, wherein the program code initiates providing an indication of an occlusion if the relationship between the first and second instantaneous force values departs from the expected slope relationship.

48. (Currently Amended) The syringe pumping system of claim 46, wherein the program code initiates determining a time window defining at least one of time T1 and time T2.

49. (Currently Amended) The syringe pumping system of claim 46, wherein the program code initiates determining at least one of the expected slope relationship and the relationship between the first and second instantaneous force values.

50. (Currently Amended) The syringe pumping system of claim 46, wherein the expected slope relationship includes an occlusion slope.

51. (Currently Amended) The syringe pumping system of claim 46, wherein the program code initiates comparing the expected slope relationship to the relationship between the first and second instantaneous force values.

52. (Original) The syringe pumping system of claim 46, wherein the program code initiates comparing an occlusion slope to a trial slope.

53. (Currently Amended) The syringe pumping system of claim 46, wherein the program code initiates determining a third instantaneous force value indicative of a force between the fluid source and the patient taken at times T2 and T3, respectively.

54. (Currently Amended) The syringe pumping system of claim 46, wherein the program code initiates determining a third instantaneous force value indicative of a force between the fluid source and the patient taken at times T1 and T3, wherein T3 is subsequent to T2.

55. (Currently Amended) A pumping system, comprising:

a fluid source;

a fluid line configured to carry fluid under pressure between the fluid source and a patient;

a sensor for determining at least one of first and second instantaneous force values indicative of the force between the fluid source and the patient taken at times T1 and T2, respectively;

a pump configured to generate a force between the fluid source and the patient; and

a processor in communication with the pump, the processor being configured to execute program code that determines if a relationship between the first and second instantaneous force values departs from an expected slope relationship.

56. (Currently Amended) The pumping system of claim 55, wherein the program code initiates providing an indication of an occlusion if the relationship between the first and second instantaneous force values departs from the expected slope relationship.

57. (Original) The pumping system of claim 55, wherein the program code initiates determining a steady state condition.

58. (Currently Amended) The pumping system of claim 55, wherein the program code initiates determining a count indicative of the at least one of the first and second instantaneous force values.

59. (Currently Amended) The pumping system of claim 55, further comprising a transducer configured to generate a count from at least one of the first and second instantaneous force values.

60. (Currently Amended) The pumping system of claim 55, wherein the program code initiates determining a time window defining at least one of time T1 and time T2.

61. (Currently Amended) The pumping system of claim 55, wherein the program code initiates determining at least one of the expected slope relationship and the relationship between the first and second instantaneous force values.

62. (Currently Amended) The pumping system of claim 55, wherein the relationship between the first and second force instantaneous values includes a trial slope.

63. (Currently Amended) The pumping system of claim 55, wherein the expected slope relationship includes an occlusion slope.

64. (Currently Amended) The pumping system of claim 55, wherein the program code initiates comparing the expected slope relationship to the relationship between the first and second instantaneous force values.

65. (Original) The pumping system of claim 55, wherein the program code initiates comparing an occlusion slope to a trial slope.

66. (Currently Amended) The pumping system of claim 55, wherein the program code initiates shifting a time window to obtain an additional instantaneous force value.

67. (Original) The pumping system of claim 55, wherein the program code initiates canceling the indication of the occlusion in response to a comparison between a trial slope and a cancellation slope.

68. (Original) The pumping system of claim 55, wherein the program code initiates altering delivery of the fluid.

69. (Currently Amended) The pumping system of claim 55, wherein the program code initiates altering delivery of the fluid in response to comparing the first instantaneous force value to a bolus occlusion limit.

70. (Original) The pumping system of claim 69, wherein the program code initiates resuming delivery of the fluid after a delay time.

71. (Currently Amended) The pumping system of claim 69, wherein the program code initiates resuming delivery of the fluid in response to comparing the first instantaneous force value to a bolus occlusion limit.

72. (Currently Amended) The pumping system of claim 55, wherein the program code initiates determining a third instantaneous force value indicative of a force between the fluid source and the patient taken at times T2 and T3, respectively.

73. (Currently Amended) The pumping system of claim 55, wherein the program code initiates determining a third instantaneous force value indicative of a force between the fluid source and the patient taken at times T1 and T3, wherein T3 is subsequent to T2.

74. (Currently Amended) A pumping system, comprising:

a fluid source;

a fluid line configured to carry fluid under force between the fluid source and a patient;

a sensor for determining at least one of first and second instantaneous force values indicative of the force between the fluid source and the patient taken at times T1 and T2, respectively;

a pump configured to generate the force between the fluid source and the patient; and

a processor in communication with the pump, the processor being configured to execute program code that initiates altering delivery of the fluid in response to determining that the at least one of the first and second instantaneous force values deviates from an expected value.

75. (Original) The pumping system of claim 74, wherein the program code initiates determining if a bolus infusion is being delivered.

76. (Original) The pumping system of claim 74, wherein the program code initiates resuming the delivery of the fluid after a delay period.

77. (Original) The pumping system of claim 74, wherein the program code initiates resuming the delivery of the fluid at a reduced infusion rate.

78. (Currently Amended) A syringe pumping system, comprising:

a syringe configured to contain fluid and including an outlet;

a housing adapted to support the syringe;

a plunger having an end and configured to move within the syringe;

a pusher adapted to attach to and push the end of the plunger so as to cause the fluid to exit out of the outlet of syringe;

a fluid line connected to the outlet of the syringe and configured to carry the fluid under force to a patient;

a sensor for determining at least one of first and second instantaneous force values indicative of the force between the fluid source and the patient taken at times T1 and T2, respectively; and

a processor in communication with the pusher, the processor being configured to execute program code that initiates altering delivery of the fluid in response to determining that the at least one of the first and second instantaneous force values deviates from an expected value.

79. (Original) The pumping system of claim 78, wherein the program code initiates determining if a bolus infusion is being delivered.

80. (Original) The pumping system of claim 78, wherein the program code initiates resuming the delivery of the fluid after a delay period.

81. (Currently Amended) A pumping system, comprising:

a fluid source;

a fluid line configured to carry fluid under force between the fluid source and a patient;

a sensor for determining at least one of first and second instantaneous force values indicative of the force between the fluid source and the patient taken at times T1 and T2, respectively;

a pump configured to generate the force between the fluid source and the patient; and

a processor in communication with the pump, the processor being configured to execute program code that determines steady state by determining at least one of: a slope, a primed status, a startup time limit, a volume delivered, a startup volume and an occlusion time limit.

82. - 85. (Canceled)